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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,991	12/10/2003	Robert Fozard	PA2633US	9423

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EXAMINER	
MEJIA, ANTHONY	
ART UNIT	PAPER NUMBER
4117	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/733,991	FOZARD ET AL.	
	Examiner	Art Unit	
	Anthony Mejia	4117	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/12/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgement is made of applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) to U.S. Patent Application Ser. No. 60/512,959, filed on 10/20/03, which was abandoned prior to examination.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 6, 8, 9, 13, 15, 16, 20, 22, 23, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weber (US 6,732,104) and as evidence by Robins et al. (US 6,484,224) (referred herein after as Robins)

Regarding Claim 1, Weber discloses a storage filing system for a storage network, the storage filing system comprising:

a communication channel coprocessor (e.g., I/O devices, 164-172 of fig.3) configured to receive a request for data from a communication network (servers 124-28 of fig.2) and process the request to perform access control (col.8, lines 54-57) and determine a file system object for the data from the request (e.g., global identifier/LUN) (col.8, lines 50-54).

a file processor (e.g., virtual storage device, 134 of fig.3) configured to determine a storage location for the data in the storage network using volume services (e.g., logical volumes, 184 of fig.3) based on the file system object (e.g., global identifier/LUN) (col. 9, lines 14-22) and

a storage processor (e.g., array controllers 188 of fig. 3) connected to the storage network and configured to read the data from or write the data to the storage location (col. 6, lines 57-59).

Although, Weber does not explicitly disclose wherein the communication channel processor (I/O devices) and storage processor (array controller) comprises a plurality of symmetric processors, it would have been obvious to one of ordinary skill in the art to appreciate that enhancing performance of any computer system can be enhanced by providing the system with a plurality of symmetric microprocessors that execute the individual processes simultaneously as evidence by Robins (col. 1, lines 29-36).

Regarding Claims 2 and 23, Weber discloses a switching system (internal switched fabric, 180 of fig.3) configured to switch information between the

communication channel coprocessor, the file processor, and the storage processor (col.9, lines 30-36).

Regarding Claim 6 and 27, Weber discloses a network interface (148-154 of fig.3) configured to interface with a plurality of other storage filing systems (col.7, lines 29-33).

Regarding Claim 8, Weber discloses a method of operating a storage filing system for a storage network, the method comprising the steps of:

receiving a request (e.g., receiving access requests) for data from a communication network into a communication channel coprocessor (e.g., I/O devices, 164-172 of fig.3) (col.8, lines 54-57);

processing (e.g., interpreting/converting) the request in the communication channel coprocessor to perform access control and determine a file system object (e.g., global identifier/LUN) for the data (col.8, lines 50-54);

determining (e.g., identifying) a storage location for the data in a storage network using volume services (e.g., logical volumes, 184 of fig.3) based on the file system object (e.g., global identifier/LUN) in a file processor (e.g., virtual storage device, 134 of fig.3) (col.9, lines 14-22); and

in a storage processor (e.g., array controllers 188 of fig.3) connected to the storage network, reading the data from or writing the data to the storage location (col.6, lines 57-59).

Although, Weber does not explicitly disclose wherein the communication channel processor (I/O devices) and storage processor (array controller) comprises a plurality of symmetric processors, it would have been obvious to one of ordinary skill in the art to appreciate that enhancing performance of any computer system can be enhanced by providing the system with a plurality of symmetric microprocessors that execute the individual processes simultaneously as evidence by Robins (col. 1, lines 29-36).

Regarding Claim 9, this method claim comprises limitation(s) substantially the same, as those discussed on claim 2 above, same rationale of rejection is applicable.

Regarding Claim 13, this method claim comprises limitation(s) substantially the same, as those discussed on claim 6 above, same rationale of rejection is applicable.

Regarding claim 15, this system claim comprises limitations substantially similar to that of claim 1 and the same rationale of rejection is used, where applicable. (All limitations are being treated under 35 USC 112 6th paragraph.

Regarding the 1st limitation, the structure defined by Weber as a I/O module is equivalent to that defined by applicant as a communication channel coprocessor;

Regarding the 2nd limitation, the structure defined by Weber as a virtual storage device is equivalent to that defined by applicant as a file processor;

Regarding the 3rd limitation, the structure defined by Weber as an array controller is equivalent to that defined by applicant as a storage processor.

Regarding claim 16, this system claim comprises limitations substantially similar to that of claim 2 and the same rationale of rejection is used, where applicable. (The limitation is being treated under 35 USC 112 6th paragraph.

Regarding the limitation, the structure defined by Weber as an internal switch fabric 180, is equivalent to that defined by the applicant as a switching system.)

Regarding claim 20, this system claim comprises limitations substantially similar to that of claim 6 and the same rationale of rejection is used, where applicable. The limitation is being treated under 35 USC 112 6th paragraph.

Regarding the limitation, the structure defined by Weber as a network interface is equivalent to that defined by the applicant as a network interface.

Regarding Claim 22, Weber discloses a storage filing system for a storage network, the storage filing system comprising:

a channel coprocessor (e.g., I/O devices, 164-172 of fig.3) configured to perform access control for users (col.8, lines 54-57);

a file processor (e.g., virtual storage device, 134 of fig.3) configured to perform file services (e.g., the virtual storage device assumes the task of distributing and routing the access requests, col.5, lines 52-54) and volume services (col.9, lines 14-22); and

a storage processor (e.g., array controller 188 if fig.3) configured to perform data transactions (writing to and reading data in response to access requests) over the storage network (col.6, lines 57-59, and col.1, 29-32).

Although, Weber does not explicitly disclose wherein the communication channel processor (I/O devices) and storage processor (array controller) comprises a plurality of symmetric processors, it would have been obvious to one of ordinary skill in the art to appreciate that enhancing performance of any computer system can be enhanced by providing the system with a plurality of symmetric microprocessors that execute the individual processes simultaneously as evidence by Robins (col. 1, lines 29-36).

4. Claims 3-4, 10-11, 17-18, and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weber and as evidence by Robins and yet in further view of Chan (US 6,466,898)

Regarding Claims 4 and 25, Weber discloses the storage filing system of claim 1 as described above.

Weber does not explicitly disclose wherein the communication channel coprocessor and the file processor are configured to execute multi-threaded programs.

However, Chan, in a related field of endeavor such as multithreaded mixed hardware description languages logic simulation on engineering workstations, discloses wherein a multiprocessor system is configured to execute multi-threaded programs (col. 8, lines 40-51).

It would have been obvious to one ordinary skill in the art at the time the invention was made, to configure the processors of the communication channel coprocessors and the file processors in being able to execute multi-threaded programs

in order to improve the system's capability to execute multi-threaded applications that are implemented. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings of Weber and Chan to help improve scalability and optimization of the system.

Although, Chan does not explicitly disclose a communication channel coprocessor and file processor, it would have been obvious to one ordinary skill in the art at the time the invention was made to appreciate that in order to benefit from the execution of a multi-threaded application on a system, a multi-threaded application must be ran on a multi-processor system as taught by Chan (col. 8, lines 40-45).

Regarding Claim 3 and 24, Chan discloses wherein the multi-processor system is configured to execute unbounded programs (e.g., VHDL and Verilog design languages). In this case, "unbounded programs" are programs that are written in state-machine style, in which the states may be moved to another processor or a set of processors (*see* par [0052]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made, to recognize that VHDL and Verilog design languages can be implemented in state-machine style.

Regarding Claim 10, this method claim comprises limitation(s) substantially the same, as those discussed on claim 3 above, same rationale of rejection is applicable.

Regarding Claim 11, this method claim comprises limitation(s) substantially the same, as those discussed on claim 4 above, same rationale of rejection is applicable.

Regarding claim 17, this system claim comprises limitations substantially similar to that of claim 3 and the same rationale of rejection is used, where applicable. (The limitation is being treated under 35 USC 112 6th paragraph. Regarding the limitation, the structure defined by Chan as a multi-processor system, is equivalent to that defined by the applicant as a communication channel coprocessor and file processor.)

Regarding claim 18, this system claim comprises limitations substantially similar to that of claim 4 and the same rationale of rejection is used, where applicable. (The limitation is being treated under 35 USC 112 6th paragraph. Regarding the limitation, the structure defined by Chan as a multi-processor system, is equivalent to that defined by the applicant as a communication channel coprocessor and file processor.)

5. Claims 5, 12, 19, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weber and as evidence by Robins and in further view of Yu (US 6,807,572) and yet in further view of Coates et. al. (US 7,266,555) (referred herein after as Coates)

Regarding Claim 5 and 26, Weber discloses the storage filing system of claim 1 as described above.

Weber does not disclose wherein the storage filing system comprises a user cache configured to store the data.

However, Yu, in a similar field of endeavor such as accessing network databases, discloses a user cache configured to store the data (col.2, lines 2-7, and claim 16).

It would have been obvious to one ordinary skill in the art at the time the invention was made to utilize the teachings of Yu in Weber to enable the user in having the ability to help optimize their access time on the system. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings of Weber and Yu in making user data more accessible.

In further, the combine teachings of Weber/Yu do not disclose wherein the storage filing system comprises a meta data cache configured to store file system information.

However, Coates, in a similar field of endeavor such as methods and apparatus for accessing remote storage, discloses a meta data cache configured to store file system information (col.26, lines 3-4).

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to utilize the teachings of Coates in Weber/Yu to allow the user in being able to quickly access remote data by using the meta data that is stored on a cache. One of ordinary skill in the art at the time the invention was made would have

been motivated to combine the teachings of Weber/Yu and Coates to help lessen the system's access time by marinating directory information of the stored data.

Regarding Claim 12, this method claim comprises limitation(s) substantially the same, as those discussed on claim 5 above, same rationale of rejection is applicable.

Regarding claim 19, this system claim comprises limitations substantially similar to that of claim 5 and the same rationale of rejection is used, where applicable. (The limitation is being treated under 35 USC 112 6th paragraph. Regarding the 1st limitation, the structure defined by Yu as a cache is equivalent to that defined by the applicant as a user cache. Regarding the 2nd limitation, the structure defined by Coates as a directory cache is equivalent to that defined by the applicant as a meta data cache.)

6. Claims 7, 14, 21, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weber and as evidence by Robins and yet in further view of Blumenau et al. (US 6,845,395) (referred herein after as Blumenau)

Regarding Claim 7 and 28, Weber discloses the storage filing system of claim 1 as described above. Weber does not disclose wherein the storage filing system is further comprising a host main processor configured to provide high-level control of the storage filing system.

However, Blumenau in a similar field of endeavor such as a method and apparatus for identifying network devices on a storage network, discloses a host main processor(e.g., host processor) configured to provide high-level control of the storage filing system (col.2, lines 65-67, and col.3, lines 1-9).

It would have been obvious to one ordinary skill in the art at the time the invention was made to utilize the teachings of Blumenau in Weber to enable the user of the system to be able to manage access to data on the system. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings of Weber and Blumenau in order to help control the data on the system and to provide protection against unprivileged accesses.

Regarding Claim 14, this method claim comprises limitation(s) substantially the same, as those discussed on claim 7 above, same rationale of rejection is applicable.

Regarding claim 21, this system claim comprises limitations substantially similar to that of claim 7 and the same rationale of rejection is used, where applicable. (The limitation is being treated under 35 USC 112 6th paragraph. Regarding the limitation, the structure defined by Blumenau as a host processor, is equivalent to that defined by the applicant as a host main processor.)

7. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weber and in as evidence by Robins and in yet in further evidence by Delaney et al. (US 2005/0071546)

Regarding Claim 29, Weber discloses a system for a storage network comprising:

a communication network (e.g., servers 124-28 of fig.2);

a first storage filing system comprising:

a first channel coprocessor (e.g., I/O devices, 164-172 of fig.3) configured to perform access control for users (col.8, lines 54-57);

a first file processor (e.g., virtual storage device, 134 of fig.3) and configured to perform file services (e.g., the virtual storage device assumes the task of distributing and routing the access requests, Weber: col.5, lines 52-54) and volume services (col.9, lines 14-22); and

a first storage processor (e.g., array controller 188 of fig.3) configured to perform data transactions over the storage network (col.1, lines 29-32 and col.6, lines 57-59); and

a first interface (148-154 of fig.3) to communicate over the communication network (col.7, lines 29-33); and

a second storage filing system comprising:

a second channel coprocessor (e.g., I/O devices, 164-172 of fig.3) configured to perform the access control for the users (col.8, lines 54-57);

a second file processor (e.g., virtual storage device, 134 of fig.3) configured to perform the file services and the volume services (col.9, lines 14-22); and

a second storage processor (e.g., array controller 188 of fig.3) configured to perform the data transactions over the storage network (col.1, lines 29-32 and col.6, lines 57-59); and

a second interface (148-154 of fig.3) to communicate with the first storage filing system over the communication network (col.7, lines 29-33).

Although, Weber does not explicitly disclose wherein the first channel coprocessor and first file processor, as well as the second channel processor and second storage processor comprises of symmetric processors, it would have been obvious to one of ordinary skill in the art to appreciate that enhancing performance of a computer system can be enhanced by providing the system with a plurality of symmetric microprocessors that can execute individual processes simultaneously as suggested by Robins et al. (col. 1, lines 29-36).

In further, Weber does not explicitly disclose a communication network comprising a second filing system.

However, it would have been obvious to one ordinary skill in the art at the time the invention was made to appreciate that in adding a second filing system will increase overall storage performance by cooperative processing and will also increase the storage capacity, as suggested by Delaney (par [0012]).

Other Pertinent Prior Art

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A. Guha et al. (US 7,181,578) discloses a method and apparatus for efficient scalable storage management.

B. Forbes (US 2004/0015638) discloses a scalable modular server system.

C. Miloushev et al. (US 2004/0133607) discloses a metadata based file switch and switched file system.

D. Dichter (US 2004/0128654) discloses a method and apparatus for measuring variation in thread wait.

E. Fujita et al. (US 2005/0015475) discloses a managing method for optimizing capacity of storage.

F. Johnson et al. (US 2003/0236919) disclose a network connected computing system.

G. Chou et al. ("Instruction Path Coprocessors") disclose the concept of an instruction path coprocessor.

H. Matsunami et al. (US 2003/0023784) disclose a storage system having a plurality of controllers.

I. Padovano (US 6,606,690) discloses a system for accessing storage area network as network attached storage.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Mejia whose telephone number is 571-270-3630. The examiner can normally be reached on Mon-Thur 7:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Beatriz Prieto can be reached on 571-272-3902. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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